

Stark structure of the Yb³⁺ ion levels in (Yb_xY_{1-x})₂Ti₂O₇ and the crystal field in rare-earth titanates with a pyrochlore structure

Klimin S., Popova M., Chukalina E., Malkin B., Zakirov A., Antic-Fidancev E., Goldner P., Aschehoug P., Dhalenne G.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The absorption spectra of Yb₂Ti₂O₇ single crystals and the luminescence and luminescence excitation spectra of Y₂Ti₂O₇: Yb (1%) polycrystals were studied in the temperature range 4.2-300 K. The spectra were analyzed in terms of the crystal-field theory and the exchange-charge model. Based on the set of crystal-field parameters found for Yb₂Ti₂O₇, analogous sets of parameters were determined for other rare-earth titanates and proved to be in reasonable agreement with all available experimental data. © 2005 Pleiades Publishing, Inc.

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